

Artificial Turf Fields

An artificial turf field (ATF) is a popular alternative to a natural grass field because it requires relatively low maintenance. While most commonly used outdoors, ATFs have also been installed indoors. In recent years, health concerns have been raised about the safety of ATFs, especially with regard to potential exposure to chemicals found in ATF components. This fact sheet provides information about what ATFs are made of and ways to safely use them.

WHAT ARE ATFs MADE OF?

ATFs are typically composed of three layers – gravel or stones at the bottom, infill in the center, and artificial grass blades on top. The grass blades are made of plastic. The infill layer typically contains crumb rubber made from recycled car and truck tires. (Less frequently, infill materials can be entirely plant-based). Non-plant based infill can be composed of crumb rubber exclusively or as a mixture of crumb rubber and sand. The sand helps stabilize the field, while the crumb rubber cushions the surface and keeps grass blades upright.

WHAT CHEMICALS ARE IN ATFs?

Most often, the crumb rubber used in ATFs comes from recycled car or truck tires. Many natural and man-made substances are used during tire manufacturing, and some of those chemicals have been found in crumb rubber infill. These include volatile organic compounds (VOCs), semi-VOCs (SVOCs) such as polycyclic aromatic hydrocarbons (PAHs), and metals such as lead.

CAN I BE EXPOSED TO CHEMICALS WHILE USING ATFs?

There are several possible ways to be exposed to the chemicals found in the crumb rubber:

- Breathing in volatile chemicals or dust particles generated from the crumb rubber.

- Swallowing small amounts of crumb rubber either while playing on the fields, or afterward, if hands are not washed.
- Skin contact with crumb rubber.

CAN I BE EXPOSED TO LEAD WHEN PLAYING ON ATFs?

Lead has been detected in the crumb rubber of some ATFs. However, since the number of fields sampled for lead is very small, the results cannot be generalized to all ATFs. Some ATFs are also constructed with components that are certified as having low or no lead content. Using ATFs with this certification can help minimize exposure to lead.

CAN EXPOSURE TO CHEMICALS IN ATFs AFFECT MY HEALTH?

At sufficiently high exposures, the chemicals found in crumb rubber can cause irritation of the eyes, nose, throat, and skin, as well as headaches, nausea, and even organ damage. Some PAHs may also increase the risk of developing cancer if individuals are exposed to very high concentrations over long periods of time. However, many factors determine whether exposure to chemicals through ATF usage can affect health. These include the amount, frequency, and duration of exposure; the amount of chemical absorbed into the body; and the sensitivity of an individual (e.g., children are generally more sensitive than adults).

To date, scientific research largely has concluded that adverse health effects from using ATFs are unlikely. While crumb rubber infill contains potentially harmful chemicals, the concentrations are generally below levels of concern. However, it is important to note that the research had various limitations, such as the small number of fields tested. Furthermore, no studies have evaluated whether there is a relationship between disease outcomes and exposure to crumb rubber in ATFs.

IS RESEARCH ADDRESSING ATFs AND HEALTH?

Yes. A joint effort between the U.S. Environmental Protection Agency, Centers for Disease Control and Prevention, and Consumer Product Safety Commission is underway. This *Federal Research Action Plan* will answer questions about the chemical composition of crumb rubber and chemical concentrations by testing indoor and outdoor ATFs across the country. The collaboration will also survey and observe people using ATFs to collect data to evaluate exposure to chemicals (e.g., frequency and duration of use). This federal effort will offer a better understanding of potential exposure to chemicals in the crumb rubber.

To learn more about the *Federal Research Action Plan*, visit: <https://www.epa.gov/chemical-research/tire-crumb-questions-and-answers>

CAN USING ATFs INCREASE MY RISK FOR BACTERIAL INFECTIONS?

Very limited research has found that ATFs contain fewer bacteria (e.g., MRSA) than soil possibly because ATFs have less moisture and other yet unknown factors that reduce bacterial growth. California's Environmental Protection Agency also found that while athletes experience more frequent turf burns on ATFs compared to natural fields, the severity was similar between the two types of fields. The joint federal study will better characterize bacterial populations associated with the tire crumb rubber infill collected from ATFs.

DOES MDPH SUPPORT THE USE OF ATFs?

MDPH does not endorse any consumer products, including ATFs. The purpose of this fact sheet is to summarize currently available information and offer suggestions for ways to minimize possible

exposure to potentially harmful chemicals during use of ATFs.

ARE THERE TIPS FOR SAFER USE OF ATFs?

Yes. MDPH recommends these common sense steps to minimize potential exposure to potentially harmful chemicals in ATFs.

When playing on ATFs

- Always wear shoes.
- Do not swallow any crumb rubber that accidentally enters the mouth. Monitor young children to prevent swallowing.
- If playing indoors, ensure adequate ventilation.
- Be aware of any heat-related illnesses.

After playing on ATFs

- Wash hands after use and before eating (especially young children).
- Clean all clothing and equipment.
- Take off shoes before entering the house to prevent tracking in any crumb rubber.
- Clean all turf burns with soap and water.

Do not use ATFs

- On extremely hot days because the crumb rubber absorbs heat and may be too hot to play on when temperatures are high.
- For passive recreation (e.g., sitting, laying).

WHO CAN I CONTACT TO LEARN MORE?

Specialists at the Massachusetts Department of Public Health, Bureau of Environmental Health, are available to answer your questions. Contact us at 617-624-5757 (TTY: 617-624-5286) or visit us at www.mass.gov/dph/environmental_health.



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